

# PATENT SPECIFICATION



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335,329

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## PROVISIONAL SPECIFICATION.

### Improvements in Telephonic or like Loud Speakers.

I, PERCY ALBERT CRAVEN, of 13A, Alexandra Road, Gipsy Hill, London, S.E. 19, British Subject do hereby declare the nature of this invention to be as follows:—

The object of my invention is to provide a loud speaker device suitable for wireless telephony and the like whereby all manner of sound may be amplified and reproduced without distortion, and true to the source of origin.

In order to carry my invention into effect, I provide a band or hoop, preferably of bamboo, of any desired diameter, to which I attach, removably or otherwise, the open end of a cone or trumpet-shaped fabric piece, which may be of any suitable material, or substance, but preferably of Irish Linen, such as is generally known as "Cambric". I provide a small cone-shaped body, which is inserted into the apex of the cone fabric, and which is provided with a central passage, as also with a multiple of recesses situated at the base thereof to receive what I term spring stays or ribs which may be composed of any springy substance or material, such as piano-wire or strips of bamboo, and which may be adjustable as to length. The ends of such ribs being inserted, in tension, in the recesses formed for that purpose in the base of the small cone-shaped body, previously referred to, and the other ends in similar or like manner inserted within similar or like recesses provided for that purpose

in or on the interior surface of the band or hoop to which the open end of the cone fabric is attached—the necessary tension, which may be constant, required for stretching the cone fabric on what I may term its frame, as well as enabling said fabric to acquire a desired curvature or flare, which is in itself an important factor in obtaining the object of this invention, being obtained by regulating the length of the aforesaid spring stays or ribs to that required to give them an outward propelling force sufficient for this purpose when inserted within their respective recesses. For the purpose of further stiffening the said fabric and tightening the threads thereof when stretched on its frame, I may immerse or otherwise coat the cone fabric or any part thereof, when so stretched with collodion or like medium, and I may further supply a coating or coatings of varnish powdered Conch, Murex, or like shells, mixed with a hardening and drying substance such as varnish.

I desire it to be understood that I do not necessarily fix the before mentioned stays or ribs in their respective recesses, they may, if desired, be removed after the stiffening process is complete, as also the rim. The method of attachment to the Unit is that which governs all Loud Speakers.

Dated this 7th day of August, 1929.  
P. A. CRAVEN,

## COMPLETE SPECIFICATION.

### Improvements in Telephonic or like Loud Speakers.

I, PERCY ALBERT CRAVEN, of 13A, Alexandra Road, Gipsy Hill, London, S.E. 19, British Subject do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to a diaphragm for reproducing sound and used more especially for wireless telephony and like  
[Price 1/-]

purposes of the kind in which a thin membrane assumes a conical or flared form due to being held constantly under stress between its base and apex by spring means.

According to my invention I provide a band or hoop, preferably of bamboo, of any desired diameter to which I attach removably or otherwise, the open end of a cone or trumpet-shaped piece of fabric

which may be of any suitable material, preferably of Irish Linen, such as is generally known as "Cambric". I provide a small cone-shaped body, which is fixed to the cone fabric at the apex thereof, and is provided with a central passage and a plurality of recesses in its base. The ends of spring stays or ribs of material such as piano-wire, or strips of bamboo are inserted in the recesses in the base of the small cone-shaped body and in corresponding recesses provided in or on the interior surface of the band or hoop to which the open end of the cone fabric is attached the said ribs being longer than the straight-line distance between each recess in the small body member and the corresponding recess in the band or hoop so that the said ribs are flexed when in place and stretch the fabric on what I may term its frame and constrain said fabric to acquire a curvature or flare, which is in itself an important factor in obtaining a diaphragm giving faithful reproduction over audible limits. The length of the stays or spring ribs may be adjusted as required to give them a longitudinal thrust sufficient to impart the desired flare to the fabric when they are inserted within their respective recesses. For the purpose of further stiffening the said fabric and tightening the threads thereof when stretched on its frame, I may coat this fabric, by immersion or otherwise, with collodion or like medium.

The method of attachment to the unit is that which governs all loud speakers.

A loud speaker diaphragm in accordance with my invention is illustrated by way of example in the accompanying sectional perspective drawing.

In this example a membrane 1 of "Cambric" or the like and initially of shallow conical form or of slightly flared form is attached at its periphery to a bamboo hoop 2 and near its apex to a small conical body 3 through which is passed a threaded sleeve 4 for the attachment of a clamping cone-washer 5 and for connecting the whole to a drive-rod, not

shown, extending from a suitable reproducing unit. The base of the member 3 is provided with four equally spaced recesses such as 6 and the inner surface of the hoop 2 has four corresponding recesses such as 7: the recesses 6 and 7 receive the ends of radial ribs 8 of spring wire which ribs, by virtue of their length, become flexed when positioned as shown and in tending to thrust the hoop away from the body 3 tension the membrane. In order to contract the membrane so as to increase its tautness and to cover its pores and stiffen it, it is coated, say by immersion, with collodion or like medium whilst stretched on the frame.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A diaphragm for telephonic loud speakers and the like of the kind comprising a membrane of conical or flared form and spring means adapted to tauten the membrane between its base and apex, provided with a hoop or the like secured around the base of the membrane and spring ribs constantly in stress between the hoop and a body such as 3 fixed to the apex of the membrane, the body being recessed to receive the corresponding ends of the ribs.

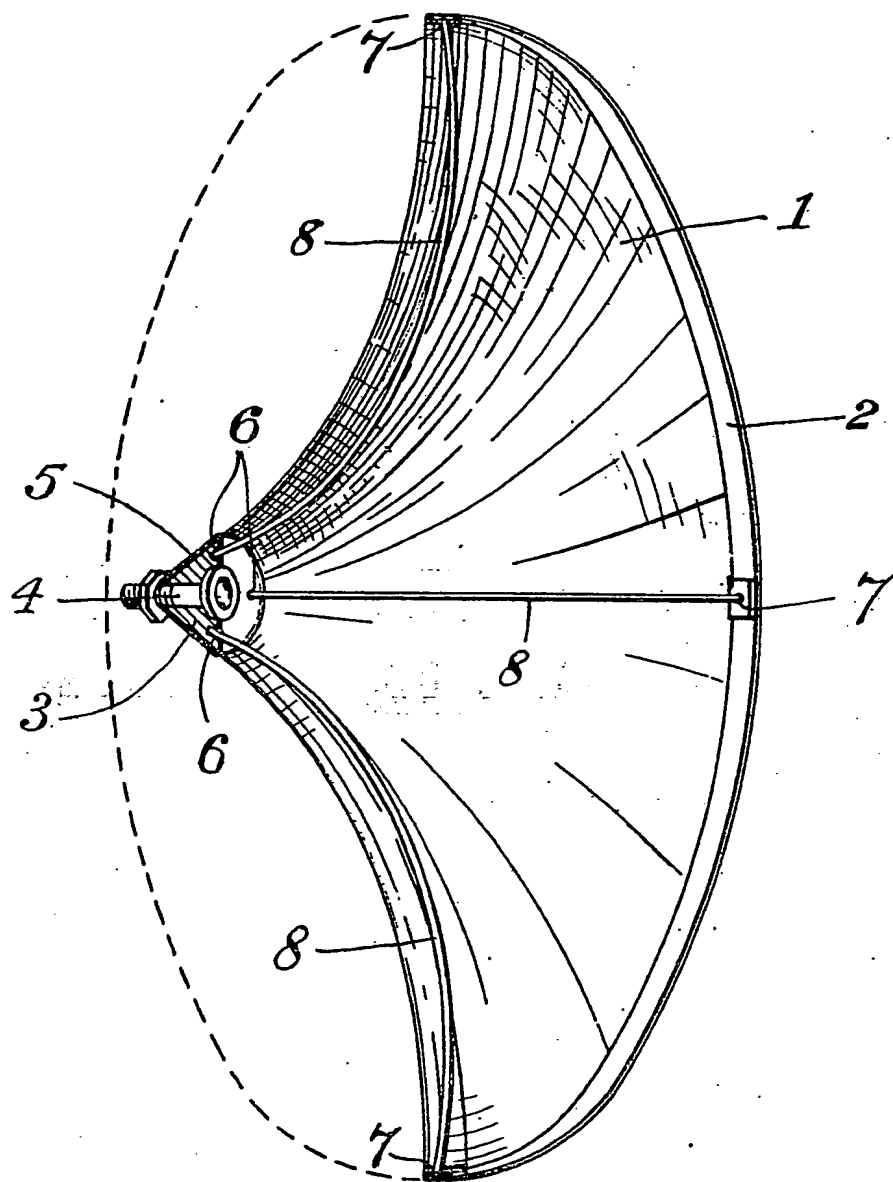
2. A diaphragm according to claim 1, including a membrane coated with collodion or the like substantially as and for the purpose herein described.

3. A diaphragm according to claim 2, with the body such as 3 provided with means for connection to the drive rod of an appropriate electromagnetic or like unit.

4. Loud speaker diaphragms substantially as herein described and illustrated.

Dated this 4th day of June, 1930.  
HY. FAIRBROTHER,  
Chartered Patent Agent,  
30 & 32, Ludgate Hill, London.

*[This Drawing is a full-size reproduction of the Original]*



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